

REMARKS

Status of the Claims

Claims 1, 3-5, and 14-23 are pending, with claims 1 and 23 being independent. Claims 2 and 6-13 have been canceled without prejudice to or disclaimer of the subject matter contained therein. Claims 1, 5, and 23 have been amended to even more clearly recite and distinctly claim particularly preferred embodiments of the present invention. Claims 3 and 4 have been amended to correct their recited dependency since claim 2 has been canceled. Support for the amendments may be found throughout the specification, including in the original claims. Therefore, no new matter has been added.

Applicants respectfully request the Examiner to reconsider and withdraw the outstanding rejections in view of the foregoing amendments and the following remarks.

Objection to the Specification

The specification was objected to for not providing the serial numbers of cited related applications on page 1 and for not reflecting the presence of Figures 2A and 2B on page 6. The specification has been amended herein to include the serial numbers of the cited related applications and to reflect the presence of Figures 2A and 2B. Accordingly, Applicants respectfully request that this objection be withdrawn.

Claim Rejections Under 35 U.S.C. § 102

Claims 1, 6, 12-16, 18, and 20-22 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 2,651,655 (“Loughran”). Applicants respectfully disagree with the rejection; therefore, this rejection is respectfully traversed.

Loughran relates to the treatment of hydrocarbons to produce purified paraffin wax. (Col. 1, lines 1-10). Loughran discloses that it is important that the purified paraffin wax product have a clear whitish appearance. (Col. 4, lines 57-62).

Loughran discloses that the hydrogenation of carbon oxides in the presence of a metallic catalyst, such as iron, cobalt, nickel or ruthenium, produces a waxy product that may be highly colored by the present of color-imparting unsaturated hydrocarbons comprising olefins and

possibly acetylenes, and color-imparting metallo-organic compounds. (Col. 1, lines 11-18). Accordingly, Loughran discloses a process for removing these color-imparting compounds from the waxy product. As such, Loughran discloses dissolving the waxy product in a solvent and contacting the resulting solution with a solid absorbent. (Col. 2, lines 23-34). Loughran discloses that the solid absorbent employed is preferably a solid siliceous absorbent, such as an acid-treated bentonite clay, e.g., Super Filtrol, natural clays which may be treated to improve their absorbent properties, silica gel, or synthetic silica-alumina complexes. Loughran further discloses that other adsorbents that may be employed include solid carbonaceous adsorbents, e.g., wood charcoal, activated carbon from various sources, and carbonaceous adsorbents from animal sources such as bone black; and activated alumina. (Col. 3, lines 25-36).

In contrast, present independent claim 1 recites a method of removing contamination from a Fischer-Tropsch derived hydrocarbon stream comprising passing the Fischer-Tropsch derived hydrocarbon stream to a treatment zone; providing an ***ion exchange medium comprising a crosslinked, ion exchanging polymeric resin*** within the treatment zone; contacting the Fischer-Tropsch derived hydrocarbon stream with the ion exchange medium within the treatment zone to remove ***contamination comprising at least one element selected from the group consisting of Al, Co, Ti, Fe, Mo, Na, Zn, Si, and Sn*** from the Fischer-Tropsch derived hydrocarbon stream; and removing a purified stream from the treatment zone.

To anticipate a claimed invention under §102, a reference must teach each and every element of the claimed invention. *See Lindeman Maschinenfabrik GmbH v. American Hoist and Derrick Company*, 221 USPQ 481, 485 (Fed. Cir. 1984). It is respectfully submitted that in no way does Loughran disclose or suggest the presently claimed process of claim 1. As described above, Loughran relates to the treatment of hydrocarbons to produce purified paraffin wax and as such, Loughran discloses contacting a solution of the wax in a solvent with a solid absorbent, wherein the solid absorbent employed is a solid siliceous absorbent (such as an acid-treated bentonite clay, e.g., Super Filtrol, natural clays which may be treated to improve their absorbent properties, silica gel, or synthetic silica-alumina complexes); a solid carbonaceous absorbent (e.g., wood charcoal, activated carbon from various sources, or carbonaceous adsorbents from animal sources such as bone black); and activated alumina. (Col. 3, lines 25-36).

Accordingly, it is respectfully submitted that in no way does Loughran discloses or suggest the presently claimed method of removing contamination from a Fischer-Tropsch derived hydrocarbon stream comprising passing the Fischer-Tropsch derived hydrocarbon stream to a treatment zone; providing an ion exchange medium comprising a crosslinked, ion exchanging polymeric resin within the treatment zone; contacting the Fischer-Tropsch derived hydrocarbon stream with the ion exchange medium within the treatment zone to remove contamination comprising at least one element selected from the group consisting of Al, Co, Ti, Fe, Mo, Na, Zn, Si, and Sn from the Fischer-Tropsch derived hydrocarbon stream; and removing a purified stream from the treatment zone.

As Loughran does not disclose each and every element of the claims, it cannot anticipate the presently claimed invention of claim 1 or claims dependent thereon. Accordingly, withdrawal of the rejection under 35 U.S.C. § 102(b) is respectfully requested.

Claim Rejections Under 35 U.S.C. § 103

Claims 7-11 and 17 stand rejected under 35 U.S.C. § 103(a) as allegedly being obvious in view of Loughran. Applicants respectfully disagree with the rejection; therefore, this rejection is respectfully traversed.

Claims 7-11 have been canceled, thus rendering the rejection of claims 7-11 moot. As provided above, amended claim 1, upon which claim 17 depends, recites a method of removing contamination from a Fischer-Tropsch derived hydrocarbon stream comprising passing the Fischer-Tropsch derived hydrocarbon stream to a treatment zone; providing an ***ion exchange medium comprising a crosslinked, ion exchanging polymeric resin*** within the treatment zone; contacting the Fischer-Tropsch derived hydrocarbon stream with the ion exchange medium within the treatment zone to remove ***contamination comprising at least one element selected from the group consisting of Al, Co, Ti, Fe, Mo, Na, Zn, Si, and Sn*** from the Fischer-Tropsch derived hydrocarbon stream; and removing a purified stream from the treatment zone.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success.

Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

It is respectfully submitted that Loughran does not disclose or suggest all of the claim limitations of claim 17. As described above, Loughran relates to the treatment of hydrocarbons to produce purified paraffin wax and as such, Loughran discloses contacting a solution of the wax in a solvent with a solid absorbent, wherein the solid absorbent employed is a solid siliceous absorbent (such as an acid-treated bentonite clay, e.g., Super Filtral, natural clays which may be treated to improve their absorbent properties, silica gel, or synthetic silica-alumina complexes); a solid carbonaceous absorbent (e.g., wood charcoal, activated carbon from various sources, or carbonaceous absorbents from animal sources such as bone black); and activated alumina. (Col. 3, lines 25-36).

Accordingly, it is respectfully submitted that Loughran does not disclose or suggest the presently claimed method of removing contamination from a Fischer-Tropsch derived hydrocarbon stream comprising passing the Fischer-Tropsch derived hydrocarbon stream to a treatment zone; providing an ion exchange medium comprising a crosslinked, ion exchanging polymeric resin within the treatment zone; contacting the Fischer-Tropsch derived hydrocarbon stream with the ion exchange medium within the treatment zone to remove contamination comprising at least one element selected from the group consisting of Al, Co, Ti, Fe, Mo, Na, Zn, Si, and Sn from the Fischer-Tropsch derived hydrocarbon stream; and removing a purified stream from the treatment zone.

Therefore, for at least the above-provided reasons, withdrawal of this rejection under 35 U.S.C. § 103(a) is respectfully requested.

Claims 19 and 23 stand rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Loughran in view of purportedly admitted prior art regarding the filtering of a stream from a Fischer Tropsch reactor. Applicants respectfully disagree with the rejection; therefore, this rejection is respectfully traversed.

As provided above, amended claim 1, upon which claim 19 depends, recites a method of removing contamination from a Fischer-Tropsch derived hydrocarbon stream comprising passing the Fischer-Tropsch derived hydrocarbon stream to a treatment zone; providing an *ion exchange*

medium comprising a crosslinked, ion exchanging polymeric resin within the treatment zone; contacting the Fischer-Tropsch derived hydrocarbon stream with the ion exchange medium within the treatment zone to remove ***contamination comprising at least one element selected from the group consisting of Al, Co, Ti, Fe, Mo, Na, Zn, Si, and Sn*** from the Fischer-Tropsch derived hydrocarbon stream; and removing a purified stream from the treatment zone. Claim 19 recites that the method of claim 1 further includes filtering the Fischer-Tropsch derived hydrocarbon stream.

Claim 23 recites a method of removing contamination from a Fischer-Tropsch derived hydrocarbon stream comprising passing a syngas to a Fischer-Tropsch reactor to produce a Fischer-Tropsch derived hydrocarbon stream; filtering the Fischer-Tropsch derived hydrocarbon stream to produce a filtered hydrocarbon stream; passing the filtered hydrocarbon stream to a treatment zone; providing an ion exchange medium comprising a crosslinked, ion exchanging polymeric resin within the treatment zone; contacting the filtered hydrocarbon stream with the ion exchange medium within the treatment zone to remove contamination comprising at least one element selected from the group consisting of Al, Co, Ti, Fe, Mo, Na, Zn, Si, and Sn from the filtered hydrocarbon stream; removing a purified stream from the treatment zone; and passing the purified stream is passed to a hydroprocessing reactor.

It is respectfully submitted that even if Loughran were combined with a filtering step as allegedly admitted, the combination would not disclose or suggest all of the claim limitations of claims 19 or 23. As described above, Loughran relates to the treatment of hydrocarbons to produce purified paraffin wax and as such, Loughran discloses contacting a solution of the wax in a solvent with a solid absorbent, wherein the solid absorbent employed is a solid siliceous absorbent (such as an acid-treated bentonite clay, e.g., Super Filtrol, natural clays which may be treated to improve their absorbent properties, silica gel, or synthetic silica-alumina complexes); a solid carbonaceous absorbent (e.g., wood charcoal, activated carbon from various sources, or carbonaceous absorbents from animal sources such as bone black); and activated alumina. (Col. 3, lines 25-36).

Accordingly, it is respectfully submitted that even if Loughran were combined with an allegedly admitted filtering step, the combination would not disclose or suggest the presently claimed methods of removing contamination from a Fischer-Tropsch derived hydrocarbon

stream comprising passing a hydrocarbon stream to a treatment zone; providing an ion exchange medium comprising a crosslinked, ion exchanging polymeric resin within the treatment zone and contacting the hydrocarbon stream with the ion exchange medium within the treatment zone to remove contamination comprising at least one element selected from the group consisting of Al, Co, Ti, Fe, Mo, Na, Zn, Si, and Sn from the hydrocarbon stream; and removing a purified stream from the treatment zone.

Therefore, for at least the above-provided reasons, withdrawal of this rejection under 35 U.S.C. § 103(a) is respectfully requested.

Claims 2-5 stand rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Loughran in view of U.S. Patent No. 5,976,358 (“Sartori”). Applicants respectfully disagree with the rejection; therefore, this rejection is respectfully traversed.

Applicants note that the subject matter of claims 2 and 13 has been incorporated into claim 1; claim 2 has been canceled; and claims 3-5 amended to depend upon claim 1.

Accordingly, amended claim 1 recites a method of removing contamination from a Fischer-Tropsch derived hydrocarbon stream comprising passing the Fischer-Tropsch derived hydrocarbon stream to a treatment zone; providing an *ion exchange medium comprising a crosslinked, ion exchanging polymeric resin* within the treatment zone; contacting the Fischer-Tropsch derived hydrocarbon stream with the ion exchange medium within the treatment zone to remove *contamination comprising at least one element selected from the group consisting of Al, Co, Ti, Fe, Mo, Na, Zn, Si, and Sn* from the Fischer-Tropsch derived hydrocarbon stream; and removing a purified stream from the treatment zone.

As described above, Loughran discloses that the hydrogenation of carbon oxides in the presence of a metallic catalyst, such as iron, cobalt, nickel or ruthenium, produces a waxy product that may be highly colored by the present of color-imparting unsaturated hydrocarbons comprising olefins and possibly acetylenes, and color-imparting metallo-organic compounds. (Col. 1, lines 11-18). Accordingly, Loughran discloses a process for removing these color-imparting compounds from the waxy product to provide a purified paraffin wax product having a clear whitish appearance. As such, Loughran discloses contacting a solution of the wax in a solvent with a solid absorbent, wherein the solid absorbent employed is a solid siliceous

absorbent (such as an acid-treated bentonite clay, e.g., Super Filtrol, natural clays which may be treated to improve their absorbent properties, silica gel, or synthetic silica-alumina complexes); a solid carbonaceous absorbent (e.g., wood charcoal, activated carbon from various sources, or carbonaceous absorbents from animal sources such as bone black); and activated alumina. (Col. 3, lines 25-36).

Sartori discloses a process to remove +2 ionic charged metals from a petroleum feed. (Abstract). Sartori discloses that the metals to be removed include Ca, Mg, Mn, and Zn, with calcium being particularly important because calcium present in crudes can lead to fouling of heaters and heat exchangers and poison catalysts. (Col. 1, lines 8-13 and lines 34-35). Sartori discloses that the process for removing the +2 ionic charged metals from a petroleum feed includes contacting the feed with a resin that includes carboxyl, sulfonic and/or phosphonic groups. (Abstract).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143.

Applicants respectfully submit that there is no suggestion or motivation, either in Loughran or Sartori, to combine the teachings. Loughran and Sartori relate to significantly different processes for removing contaminants from significantly different feeds for significantly different purposes.

As described above, Loughran discloses that the hydrogenation of carbon oxides in the presence of a metallic catalyst, such as iron, cobalt, nickel or ruthenium, produces a waxy product that may be highly colored by the present of color-imparting unsaturated hydrocarbons comprising olefins and possibly acetylenes, and color-imparting metallo-organic compounds and Loughran discloses a process for removing these color-imparting compounds from the waxy product to provide a purified paraffin wax product having a clear whitish appearance. In contrast, Sartori discloses a process to specifically remove +2 ionic charged metals from a petroleum feed to prevent fouling of heaters and heat exchangers and to prevent poisoning of

catalysts used to upgrade the petroleum feed. Accordingly, the feed of Loughran is a colored, synthetic paraffinic wax and the feed of Sartori is a petroleum feed containing +2 ionic charged metals. The purpose of the process of Loughran is to provide a purified paraffin wax product having a clear whitish appearance and the purpose of the process of Sartori is to specifically remove +2 ionic charged metals to prevent fouling of heaters and heat exchangers and to prevent poisoning of catalysts used to upgrade the petroleum feed. In addition, there is no disclosure or suggestion in Loughran that the color-imparting metallo-organic compounds contain +2 ionic charged metals. Moreover, there is no disclose or suggestion in Sartori that the resin including carboxyl, sulfonic and/or phosphonic group will work to remove materials other than the +2 ionic charged metals. Therefore, it is respectfully submitted that there is no suggestion or motivation to combine Loughran and Sartori.

It is also respectfully submitted that there is no reasonable expectation of success in combining Loughran and Sartori. As explained above, there is no disclosure or suggestion in Loughran that the color-imparting metallo-organic compounds contain +2 ionic charged metals, and there is no disclose or suggestion in Sartori that the resin including carboxyl, sulfonic and/or phosphonic group will work to remove materials other than the +2 ionic charged metals. Therefore, it is respectfully submitted that there is no reasonable expectation of success in combining the processes of Loughran and Sartori.

It is further respectfully submitted that even if there were some suggestion or motivation to combine Loughran and Sartori and a reasonable expectation of success, Loughran and Sartori, even when combined, do not disclose or suggest all the claim limitations of claims 2-5. It is respectfully submitted that even if combined, Loughran and Sartori do not disclose or suggest a method of removing contamination from a Fischer-Tropsch derived hydrocarbon stream comprising passing a hydrocarbon stream to a treatment zone; providing an ion exchange medium comprising a crosslinked, ion exchanging polymeric resin within the treatment zone and contacting the hydrocarbon stream with the ion exchange medium within the treatment zone to remove contamination comprising at least one element selected from the group consisting of Al, Co, Ti, Fe, Mo, Na, Zn, Si, and Sn from the hydrocarbon stream; and removing a purified stream from the treatment zone.

Therefore, for at least the above described reasons, withdrawal of this rejection under 35 U.S.C. § 103(a) is respectfully requested.

Conclusion

Without conceding the propriety of the rejections, the claims have been amended, as provided above, to even more clearly recite and distinctly claim Applicants' invention and to pursue an early allowance. For the reasons noted above, the art of record does not disclose or suggest the inventive concept of the present invention as defined by the claims.

In view of the foregoing amendments and remarks, reconsideration of the claims and allowance of the subject application is earnestly solicited. In the event that there are any questions relating to this application, it would be appreciated if the Examiner would telephone the undersigned attorney concerning such questions so that prosecution of this application may be expedited.

In the event any further fees are due to maintain pendency of this application, the Examiner is authorized to charge such fees to Deposit Account No. 02-4800.

Respectfully submitted,

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